

Applicant : Peter J. Burke et al.
Appl. No. : 10/789,779
Examiner : Arun S. Phasge
Docket No. : 703538.4036

Amendment to the Specification

At page 9, line 16, please amend the specification to add the missing information:

[028] (Amended) In order to overcome the thermal Brownian force, a large electric field 110 gradient is needed. The use of a nanoelectrodes 101 and 102 allows the creation of a large field 110, based in part on both the small radius of curvature of the nanoelectrodes and the elongated structure. In **Figure 1(a)**, the gradients of the electric field 110 are substantially equivalent to a geometry where a nanoelectrode 101 or 102 is in close proximity to a large conducting plane. Upon application of a reasonable time-varying voltage (e.g., 1 Volt), the resulting gradient of field 110 in the nano-scale is sufficient to manipulate and trap nano-scale objects 105, such as single molecules. In one embodiment, a molecule 105 is trapped from a vapor phase, which can be at atmospheric pressure, and used for applications in chemical sensing of large molecules. This is discussed in L. Zheng et al., *Towards Single Molecule Manipulation with Dielectrophoresis Using Nanoelectrodes*, published in Proceeding of the Third IEEE Conference on Nanotechnology (IEEE-NANO 2003), Volume 2, pp. 437-440 ~~=====~~, ~~Volume~~ ~~____~~, pp. ~~____~~ (2003), which is fully incorporated by reference herein as if set out in its entirety. Also, the term nano-scale, as used herein, is defined broadly as covering at least sizes of the object 105 ranging from 0.1 nm to 1 μm in size, or any polarizable object 105 that can be dielectrophoretically manipulated by system 100, regardless of size.

Applicant : Peter J. Burke et al.
Appl. No. : 10/789,779
Examiner : Arun S. Phasge
Docket No. : 703538.4036

At page 13, line 19, please amend the specification to add the missing information:

[036] (Amended) In one exemplary embodiment of the aqueous catalyst method, conventional photolithography is used to fabricate wells directly into photoresist. Then, a mixture of alumina nanoparticles and $\text{Fe}(\text{NO}_3)_3 \cdot 9\text{H}_2\text{O}$ and $\text{MoO}_2(\text{acac})_2$ are added to deionized water in sequence while violently stirring. Since the $\text{Fe}(\text{NO}_3)_3$ is soluble in water, spinning this solution directly onto the wafer would undesirably remove most of the Fe. To avoid this, ammonia can be added to the mixture in concentrate, which causes the formation of $\text{Fe}(\text{OH})_3$ as a precipitant. The mixture is then stirred and sonified to create a suspension of Fe_2O_3 , MoO_3 , alumina and water. A small amount of the suspension is deposited on the wafer, which is then spun and baked. Then, lift-off of the photoresist in acetone provides the catalyst pattern ready to carry out CVD to form the carbon nanotubes. This process is described in greater detail in S. Li et al., "Carbon Nanotube Growth for GHz Devices," published in Proceeding of the Third IEEE Conference on Nanotechnology (IEEE-NANO 2003), Volume 2, pp. 256-258, ~~Volume~~, ~~pp.~~ (2003), which is fully incorporated by reference as if set out in its entirety.